

**Second Generation DART system**  
**Proposal to build and full-ocean test one bi-directional DART system based on requirements: \$203,500**

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**Need:**

The first generation DART system has had remarkable reliability using components available 5 years ago. Now some of those components are becoming obsolete and replacement components need to be integrated and tested into the existing DART system. In addition, the first generation DART had only one way communication using GOES satellite. One way communications limit the ability of the warning centers to access DART data when they need it. For example, the Mexico tsunami of January 2003 was not large enough to trip the equatorial DART buoy. The warning centers should have the ability to query a DART buoy to determine the exact amplitude of the tsunami to verify that the DART buoy is working properly. In addition, it would better to cancel a warning based on real data rather than the absence of a trigger. Finally, these data would be valuable in refining the tsunami forecast methodology under development.

With these considerations in mind, NOAA proposes to replace obsolete components and add a bi-directional communications system in one test DART system to be deployed in 2003. The bi-directional communication system would also serve as an independent communication system to the reliable GOES communication system. Results from the tests will be used to modify the 6 operational DART buoys in FY04 so they all have bi-directional communications and available components. Based upon successful testing and availability of additional operational funds, the test DART buoy could become the 7th DART buoy as early as FY05.

**Major components:**

1) GOES and Iridium DART system

- Current GOES transmitters are obsolete and new 300 baud units may not be compatible with DART goals, tests of Sutron units is underway, Iridium gives bi-directional communications.

2) New acoustic modem ATM 880

- Replaces obsolete modem card, new modem are not backwards

compatible, software updates. Higher baud rate.

3) New 3.3 volt 68332 board

- Over 10 years of data storage, at reduced power consumption with non-volatile

compact flash card, smaller PCB footprint. Replaces obsolete BPR CPU components.

4) New GPS receiver

- Cheaper, ruggedized, reduced power consumption, replaces obsolete components

### **Features:**

1) Standard message (GOES & Iridium): Four transmissions per day. Each transmission reports 15min values for 6 hours (24 pressure values).

Improved

hourly time stamping

2) Remote trigger command via Iridium

3) Realtime remote data access via desktop & Iridium:

One hour of raw 15 sec data (2048 bytes/hour) per interrogation.

4) Software upgrades:

a) Software trip regenerates every year on the same date,

b) Re-initialize deployment mode; saves 3 hrs of shiptime during buoy swap outs, improves quality control

5) Extended life BPR (up to 4 years); extended life Buoy (up to 2 years), significant

cost reduction- potentially eliminates 1 cruise every other year.

### **Test Plan for 2003:**

Lab tests leading up to full ocean testing and system deployment.

### **Budget:**

Hybrid GOES/Iridium Buoy, airtime charges: \$100,000

BPR(acoustic release on loan): \$37,000

Development Labor: \$53,000

*(EE, ET, ME, mooring & machine shop time)*

Data display, demonstration website \$8,500

Sea time, logistics, shipping to Kodiak, AK \$5,000

Total \$203,500